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Preliminary Results from the Inshore Sentinel Surveys for Cod in NAFO Subdivision 3Ps

by

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Research documents are produced in the official language in which they are provided to the secretariat.

[1]La présente série documente les bases scientifiques des évaluations des ressources halieutiques sur la côte atlantique du Canada. Elle traite des problèmes courants selon les échéanciers dictés. Les documents qu'elle contient ne doivent pas être considérés comme des énoncés définitifs sur les sujets traités, mais plutôt comme des rapports d'étape sur les études en cours.

Les Documents de recherche sont publiés dans la langue officielle utilisée dans le manuscrit envoyé au secrétariat.

Abstract

A sentinel fishery or sentinel survey project in NAFO Subdivision 3Ps was formally announced by the Minister of Fisheries and Oceans in October 1994. Twelve sites from Ramea to Burgeo were fished up to 3 days per week using 1000 baited hooks or a maximum of six gillnets from February 20, 1995 to July 8, 1995. Both fixed and randomly selected locations were fished on traditional fishing grounds. The spatial distribution of catches from the survey were consistent with the timing of a late winter and early spring fishery. Catch rates were reported to be as good or better than in the year preceding the implementation of the moratorium although fishermen cautioned that increased effort on the fishing grounds may decrease catch rates.

Résumé

En octobre 1994, le ministère des Pêches et des Océans avait officiellement annoncé le lancement d'une pêche sentinelle, ou projet d'étude sentinelle, dans la subdivision 3Ps de l'OPANO. Cette pêche sentinelle allait être pratiquée jusqu'à trois jours par semaine, au moyen de 1 000 hameçons appâtés ou d'un maximum de six filets maillants, dans douze lieux entre Ramea et Burgeo, à compter du 20 février et jusqu'au 8 juillet 1995. Tant dans les lieux choisis à l'avance que dans ceux qui ont été sélectionnés au hasard, cette activité s'est déroulée sur les bancs de pêche traditionnels. La distribution spatiale des prises s'est révélée conforme à celle d'une pêche de fin d'hiver ou de début de printemps. Les pêcheurs ont indiqué que les taux de prises étaient égaux ou supérieurs à ceux de l'année ayant précédé le moratoire, mais ont prévenu que ces taux pourraient diminuer en cas d'accroissement de l'effort sur les lieux de pêche.

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Introduction

A sentinel fishery or sentinel survey project in NAFO Subdivision 3PS was formally announced by the Minister of Fisheries and Oceans in October 1994. The survey is an extension of the index fishermen's project from the Northern Cod Science Projects with modifications to allow for activities achievable only under a fishing moratorium.

The 3Ps sentinel survey has the following objectives:

1. To describe the temporal-spatial distribution of cod in the inshore area over a number of years through, for example, the use of catch rate information, tagging studies, by-catch information and fishers' observations.

2. To develop a reliable catch rate series for use in resource assessments.

3. To gather length frequencies, sex and maturity data and otoliths for use in resource assessment.

4. To establish a long-term physical oceanographic and environmental monitoring program of the inshore area of Subdivision 3Ps.

5. To provide a source of biological material for other researchers. For example, tissue for genetic, physiological and toxicological analyses, cod stomachs for food and feeding studies and by-catch information.

6. To incorporate the knowledge of inshore fishers in to the process of resource assessment.

Methods

Participants

The primary collectors of data in the sentinel survey are inshore fishers. In order to establish a standardized data collection routine and provide a rationale for the data collection methods, a science training program was developed jointly by DFO and the Marine Institute of Memorial University of Newfoundland. One person from each sentinel survey crew participated in a 6 week training course prior to commencing the sentinel survey. The training course provided an introduction to data collection, sampling methods and tools, use of computers and electronic oceanographic monitoring instruments. Participants also received overviews of ocean ecology and biology and resource management.

Sites

Sampling is conducted at 12 sites by 12 crews in Subdivision 3Ps from Ramea to St. Brides in Placentia Bay (Figure 1). The sites were chosen through consultation between DFO scientists, fishermen and the Fishermen, Food and Allied Workers Union (FFAW). Site selection was based on the need to survey throughout the inshore area of Subdivision 3Ps and targeted historical fishing areas.

Sampling

Sampling started during the week of February 20, 1995 and will finish on July 8, 1995. Each crew fishes up to 3 days per week. Fishing days in the week are selected at the discretion of the crew and depend primarily on weather conditions.

Six boats fish two tubs of baited line trawl. Each tub consists of 500 hooks for a total of 1000 hooks per fishing day. The line trawl sites are Ramea, Francois, Seal Cove, Harbour Breton, Rencontre East and Arnold's Cove. The other six sites fish 2-10 fifty fathom monofilament gillnets. At present, the nets are rigged 2-3 to a fleet but only two fleets are fished per fishing day. The gillnet sites include Monkstown, North Harbour, Little Harbour East, Fox Harbour, Red Island/Clattice Harbour and St. Brides.

Prior to the start of sampling in February, a fixed (control) location on the fishing grounds was established for each site for the duration of the project. Each fishing day, half of the gear is set at the control site. The other half of the gear (experimental) is set anywhere on the fishing grounds at the discretion of the crew. The location of each fishing set is plotted on a nautical chart. The time of the set and the soak time for the gear is recorded. Other environmental observations are recorded and can include wind direction and speed, percent cloud cover, tide conditions, presence of invertebrates (bait) and other fish species in the area, marine mammals, sea birds and any other variable which may influence fishing behaviour. At least one CTD cast is conducted in the vicinity of the location of fishing sets each fishing day.

When the gear is retrieved, any catches from the control and experimental gear are kept separated and sampled on shore. All fish are counted, length measured, sexed, and examined for parasites. Observations are made on stomach contents and fullness. Otoliths are sampled based on length frequency requirements. Every other week, a sample of up to 100 fish is frozen and transported to St. John's for weight analysis. All information is recorded on forms similar to those used by the Port Sampling Section and on the research vessels. Otoliths are stored in manila envelopes with relevant information recorded on the outside. Fin clips are stored on blotter paper in the envelopes.

Data from CTD casts are down loaded to notebook computer and sent to St. John's on a floppy disk.

Other biological samples are collected on an "as needed" basis.

DFO Port Sampling staff have been providing field support through weekly visits to each site and regular phone contact.

Results

Catch rate information is provided for each of the 12 sites.

Analyses of frozen samples, oceanographic information, aging and length frequencies are not completed.

Catch rates from Ramea, Seal Cove and Rencontre East have been consistent throughout the survey. The timing of the survey is consistent with the conduct of a traditional south coast winter fishery. Catch rates from Francois and Harbour Breton were variable in the early weeks of the survey but have picked up in the past few weeks. Many of the participants report that if their experimental gear achieves good catches on a particular day, they make a point of moving it to another location the following fishing day rather than re-sampling the same site. There appears to be some correlation between catches at the control and experimental sites although this requires further analysis. With the exception of 1 week in March, the catch rates at Arnold's Cove have been very low. Arnold's Cove is the only line trawl site in Placentia Bay. For the most part, fish were reported to be in good condition and appeared to spawn over a period of weeks in late March, early April and early May. Participants

described catch rates to be as good or better than before the closure in 1993. Fish are also described as being more evenly distributed on the fishing grounds, unlike the patchy distribution reported to have existed prior to the moratorium.

The catch rate pattern for the sites in Placentia Bay is similar to the description of the fishery provided by fishers during an interview survey in 1994 (Davis et al. 1994). There has never been a large scale winter fishery in most parts of Placentia Bay with the exception of the very north end around North Harbour. Catch rates were low in all areas until the last few weeks when North Harbour and Red Island/Clattice Harbour reported increased catch rates. Again, this is consistent with fishers' descriptions of fish coming out of the deeper areas of the bay in early spring to spawn and feed on the capelin and herring that are reported to overwinter in the bay. Fishers in Placentia bay also describe the condition of fish as improved since the moratorium.

It is worth noting that the research vessel survey conducted in 3Ps in April 1995 did not catch any fish in the strata in Placentia Bay. However, catch rates in the unsurveyed portions of the bay were increasing around the time of the survey. The biological significance of this observation requires further exploration.

Discussion

Catch information to date from the 3Ps sentinel survey mirrors the temporal-spatial aspects of the late winter and early spring fishery throughout the area. Areas west of the Burin Peninsula which traditionally have a winter hook and line fishery clearly had the best catch rates of the sites surveyed. In contrast, the increase in catch rates in Placentia Bay is consistent with the development of an early spring fishery.

Since this is the first year of the sentinel survey, there is no time series data with which to compare. However, there is a useful reference available. Observations from fishers suggest that in all areas, catch rates are as good or better than they were prior to the closure of the fishery in 1993.

Fishers have regularly commented that the research vessel surveys conducted by DFO do not cover all of the areas which contain fish and are conducted at the "wrong" time of the year. Comparison of catch rates from the RV and sentinel surveys suggest that simultaneous conduct of sampling is desirable since the sentinel survey found fish adjacent to RV surveyed areas which were empty. Quantitative methods for incorporating sentinel survey data into analytical assessments require further development.

Acknowledgements

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Reference

Davis, M. B., P. Lundrigan and P. Ripley. 1994. A description of the cod stock structure in Placentia Bay, NAFO Subdivision 3Ps. DFO Atlantic Fisheries Research Document 94/32.

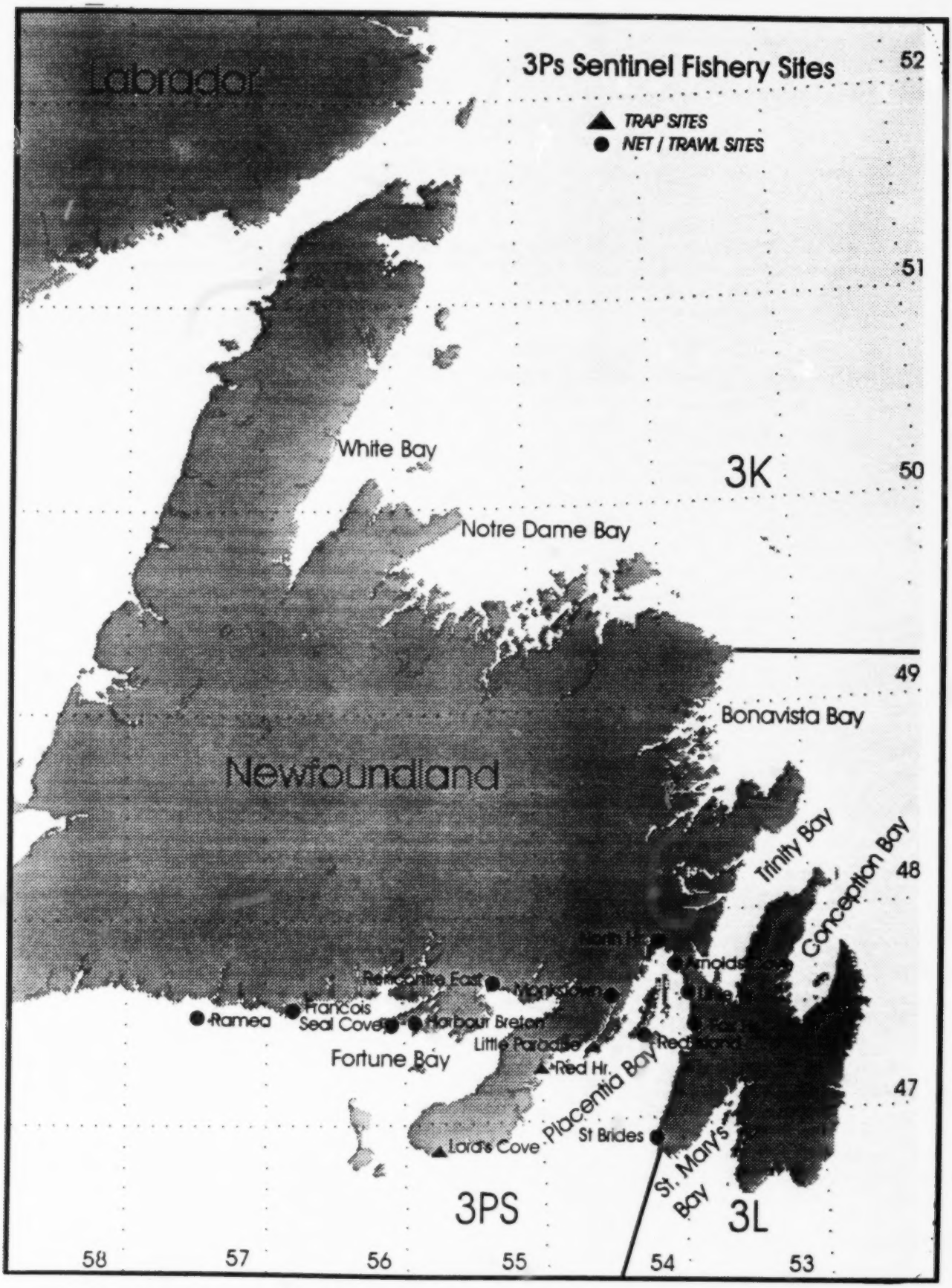

Figure 1. Sentinel Fisheries Sites in NAFO Subdivision 3Ps.

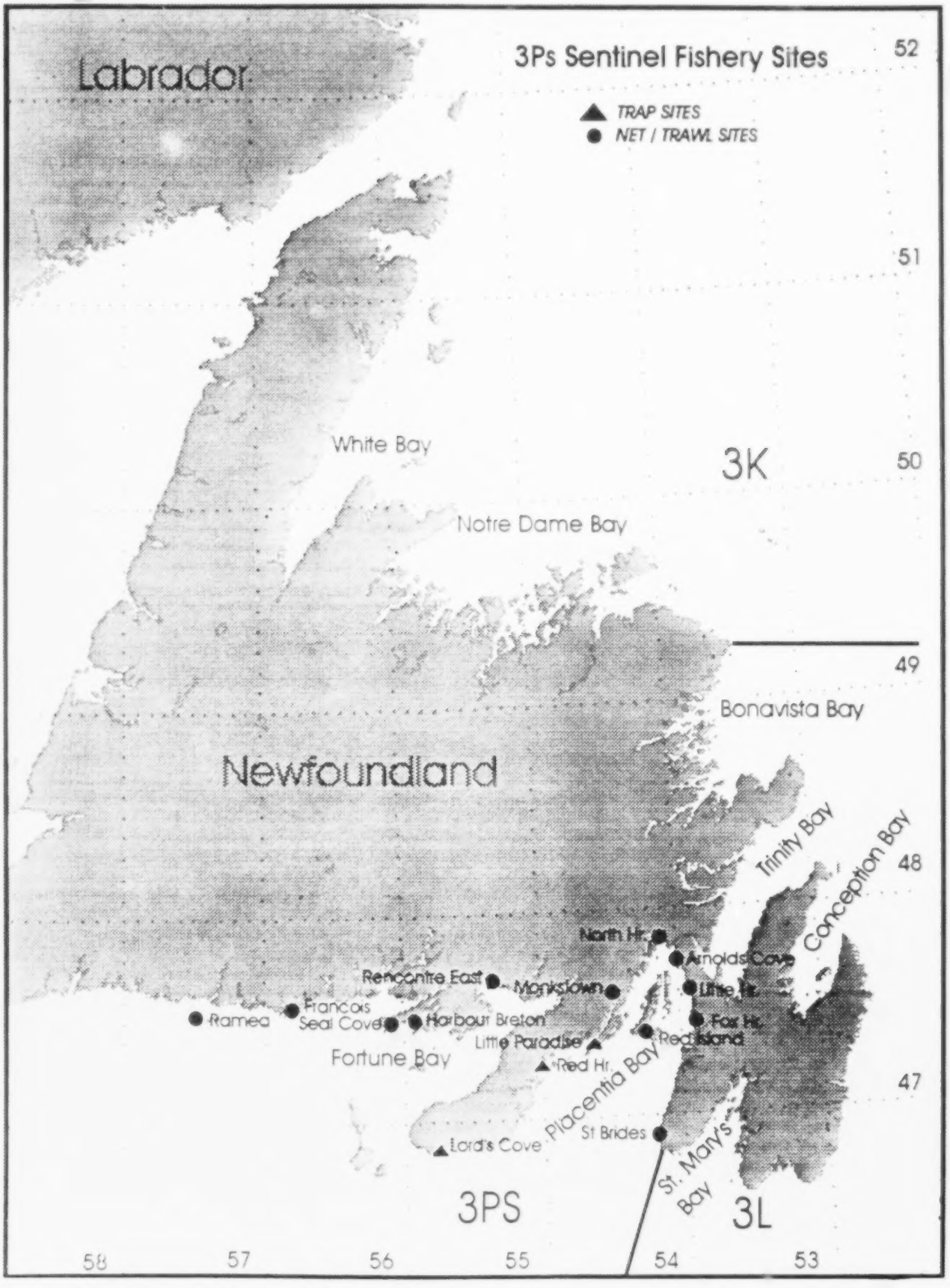

Figure 1. Sentinel Fisheries Sites in NAFO Subdivision 3Ps.